

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

**REMARKS/ARGUMENTS****PENDING CLAIMS**

Claims 72, 74, 75, 77, 80, 83, 85, 86, 88, 90, 92, 95-97 and 154-228 are currently pending in the application. Previously presented claims 86, 95, 96, 175 and 224 are currently amended, and originally and previously presented claims 72, 74, 75, 77, 80, 83, 85, 88, 90, 92, 97, 154-174, 176-223 and 225-228 remain unchanged from Applicants last response. The amendment to claim 86 merely corrects grammatical inconsistencies in the previous amendment of that claim. The amendments to claims 175 and 224 correctly reference claims 174 and 223, respectively, from which claims 175 and 224 depend as method claims, not system claims.

Claims 72-75, 77, 80-86, 88, 90-92, 95-97 and 154-228 have been rejected under 35 USC 103(a) as unpatentable over Conemac, US 6, 175,440 in view of Hargis et al., US 6,154,259. Applicants respectfully traverse the rejection, and request reconsideration thereof. Applicants have arranged the remarks below in four sections:

Preliminary Remarks  
Examiner's Misinterpretation of Hargis  
Examiner's Discussion of Applicants' Disclosure and Arguments  
Basis for Rejections under 35 USC 103(a)

**PRELIMINARY REMARKS**

Applicants note the Examiner's continued contentions regarding the Hargis et al. disclosure, and respectfully offer these remarks before addressing the Examiner's comments in detail. Applicants submit that the Examiner does not understand Hargis, and endeavor herein to assist the Examiner in this regard. Further, Applicants submit that the Examiner does not understand Applicants' claims.

*Applicants' Claim Recitations*

Each of applicants' claims includes similar recitations of a pattern of aligned spots angled with respect to scan lines being swept by such aligned spots during a given scan pass. However, the Examiner has rejected all of the claims at issue based on that portion of Applicants' disclosure disclosing scan lines angled or spirally formed with respect to screen boundaries, or based on Hargis which discloses scanning formats describing various sequences in which scan lines can be written within (a band or) bands on the screen. These are completely different concepts. Although each of Applicants' independent claims is discussed below, as an example of one of such claim recitations, Applicants' claim 179 includes the following recitation:

"said light beams and said scanner are configured such that a majority of said *spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths* and each of such aligned spots is swept along a different sweep path during at least one scan pass of such succession of scan passes." (emphasis added)

This is the orientation of the spots with respect to the sweep paths the spots are drawing, not the orientation of the resulting sweep paths with respect to screen boundaries, and not the sequence in which these resulting sweep paths are drawn. Applicants respectfully request that the Examiner keep these points in mind as the Examiner considers the arguments below.

Appl. No. 10/086,272  
 Amendment & Response After Final Rejection

MAG-01C

*Hargis*

Applicants' previous response on December 22, 2005 was based on Applicants' perception that the Examiner regarded Hargis as disclosing a pattern of spots in Figs. 16-29. Based on the Examiner's comments in the February 22 Office Action, Applicants are not sure if the Examiner continues to misinterpret Figs. 16-29 of Hargis to disclose a pattern of spots, or if the Examiner has misinterpreted Hargis to disclose different orientations of the scan lines with respect to screen boundaries. Therefore, before discussing Applicants claim recitations, Applicants first address below the Examiner's comments about the Hargis reference to more specifically point out that Hargis discloses different time sequences for writing the same scan lines for each different sequence, and does not disclose different patterns of spots or different orientations of the scan lines.

**EXAMINER'S MISINTERPRETATIONS OF HARGIS***The Examiner's Characterization of Hargis*

In disagreeing with Applicants' earlier remarks, the Examiner states on Page 2 of OA Feb 13, 2006:

"Although Hargis discloses that the pixel modulated are in a vertical row, those pixels are scanned in a desired arrangement (sawtooth, triangular etc...) as shown in the figures. The line periods are representative of dots/spots being illuminated."

For the reasons detailed below, the Examiner has misinterpreted Hargis.

**Definitions of Terms Used in Hargis**

Before further discussing Figs. 16-29, kindly note that Hargis defines "bands", "frame periods" and "line periods" as follows:

"For purposes of description, a frame can be subdivided into bands. A band is defined as a group of adjacent lines. Lines in multiple bands can be written simultaneously. The time necessary to write every line in a single frame is termed a "frame period". The time necessary to write a single line within a band is termed a "line period"." [Hargis, col. 14, lin. 51-57]

**Figs. 16-29 of Hargis Only Disclose Writing Lines in Different Time Sequences**

The Examiner has misinterpreted Hargis. Hargis doesn't discuss dots/spots on the screen in connection with the subject matter of Figs. 16-29 relied upon by the Examiner. In Figs. 16-29 Hargis describes the sequence in which scan lines are written. Figs. 16-29 of Hargis do not include a graphical representation of "pixels (or spots) ... scanned in a desired arrangement", but instead illustrate the sequence in which complete lines are scanned during successive line periods during a given frame (Figs. 16-19) or during multiple frame periods (Figs. 20-29). In other words, Figs. 16-29 graphically illustrate different sequences for writing lines at different times during a frame period on the screen, not patterns of spots (or pixels), and not orientations of scanned lines with respect to horizontal or screen boundaries.

**Line Periods Are NOT Representative of Dots/Spots**

In Figs. 16-19, the "darkened dots" in the upper left-hand corner are not "pixels" or spots, but represent the first line of the first and second bands that are to be written in the first line period. The empty circles in the upper left hand corner represent the remaining lines of the first band. The numbers indicate bands, not beamlets or pixels. As Hargis states:

"In FIGS. 16-19 the scale along the horizontal axis is in terms of *line periods* and the numbering along the vertical axis defines the bands. The representation in the upper left corner of the FIGS. 16-19 indicates that each of the bands contains ten lines with the first darkened dot representing

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

the first *line* of the first band and the second darkened dot representing the first *line* of the second band.” [Hargis, col. 15, lin. 1-7] (emphasis added)

To reiterate the above excerpt from Hargis, the darkened and empty dots projected out of the upper left corner of Figs. 16-19 are NOT pixels or spots, but are convenient graphical representations of lines of bands.

Further, as described in more detail below, the body of each of Figs. 16-29 shows which complete line or lines are being scanned during a given line period. Short horizontal lines are used in Figs. 16-19 and darkened dots are used in Figs. 20-29. These short lines or dots are aligned with particular line periods on the horizontal axis and line numbers on the vertical axis. Note that Figs. 20-23 are multiframe depictions of the formats depicted in Figs. 16-19.

“For the non-interleaved scanning formats such as are illustrated in FIGS. 20, 21, 22 and 23 only one band is shown to illustrate the scanning operation. All of the bands of these formats are written identically. These same scanning formats correspond to the formats described with reference to FIGS. 16-19 above.” [Hargis, col. 16, lin. 12-17]

Applicants surmise that Hargis needed a more compact graphical representation for Figs. 20-29 than that used in Figs. 16-19. Nevertheless, each depicted scan line represents a complete scanned line during a given line period, not individual dots/spots being illuminated as contended by the Examiner. Applicants find no reference in Hargis that even suggests that the dots used to depict complete lines in Figs. 20-29 are spots or pixels.

#### Saw Tooth and Other Scanning Formats

The different scanning formats of Figs. 16-19 write a frame using different sequences of writing the lines within bands. For example, Fig. 16 writes a “Saw Tooth” format, whereas Fig. 17 writes a “2X Saw Tooth” format.

In Fig. 16:

“...the lines within each band are written sequentially in order from top to bottom. In other words, a first line in every band is simultaneously written, then the second line in every band is simultaneously written and so on until all of the lines in the bands have been written which completes a single frame.” [Hargis, col. 14, lin. 61-66]

In Fig. 17:

“...the odd lines in each band are written sequentially beginning at the top of the band (first line) during the first half of the frame. The scanned beam then returns to the top of each band and writes the even lines sequentially beginning at the top during the second half of the frame.” [Hargis, col. 15, lin. 30-34]

Thus, Figs. 16-19 do not illustrate spots or pixels in different orientations writing lines, but lines within bands being written at different times.

In Figs. 20-29, by lining each black spot up with the corresponding line period in the horizontal axis and the corresponding band line in the vertical axis, the line of the band or bands being written during a particular line period can be determined. As Hargis states:

“The time for each of the figures is shown along the horizontal axis in units of line periods and the vertical axis shows the position of a line within a band. Each of FIGS. 20-29 illustrates the scanning process for two frames X and Y and the first line period of a third frame.” [Hargis, col. 16, lin. 1-5]

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

"A line scanned during a line period is indicated by a one (*sic, actually a dot*) in the box corresponding to the indicated time and line. If the box is empty, that line is not being written during that line period." [Hargis, col. 16, lin. 8-11]

Referring to Fig. 20, line 5 is written during line period 5 of Frame X, whereas in Fig. 21, line 5 is written during line period 3 of Frame X. The black spots are not pixels, or dots, or spots, they represent scanned lines. Thus, none of the figures in Hargis disclose aligned spots angled with respect to the scan lines during each of one or more scan passes.

*The Examiner's Challenge Regarding Figs. 16-29 of Hargis*

The Examiner concludes his preliminary discussion on page 2 by stating:

"Thus, not only does Hargis disclose different scanning methods (if the applicant's (*sic*) disagree with this then why are there different scan patterns illustrated in Hargis regardless (*sic*) if they originated from a vertical modulated column of pixels), the applicant's (*sic*) also admit such as being conventional (i.e., prior art)."

Applicants note that Hargis uses "scanning formats" interchangeably with "scanning methods" (e.g., Hargis, col. 14, lin. 39-40, reproduced below) and in a few instances interchangeably with "scanning patterns" (e.g., Hargis, col. 15, lin. 62-65, reproduced below). In each case, Figs. 16-29 of Hargis depicts sequences of writing lines within a band or bands.

"FIGS. 16-29 illustrate various *methods* ("formats") for scanning an image onto a display screen. In the scanning operation, the modulated beamlets are applied in parallel to the display screen. An image is created when all of the lines in the frame are written." [Hargis, col. 14, lin. 39-43] (emphasis added)

"An example of the 2X triangular scan format illustrating the order in which the lines are written is provided below with reference to FIG. 23. The *scanning pattern* illustrated in FIG. 19 depicts 10 lines in a band." [Hargis, col. 15, lin. 62-65] (emphasis added)

The application of the beamlets is not stated to change with the scanning format (method), only the sequence of writing the lines within a band or bands changes from format to format.

Applicants contend that the only pattern of spots, particularly in conjunction with Hargis' description of Figs. 16-19, is the vertical column appearing in Figs. 1, 11, 12 and 12A, and identified in Fig. 17. The only variable suggested by Hargis with regard to this column is the number of beamlets:

"Another embodiment of the laser/modulator array module is shown in FIGS. 11, 12 and 12A. FIG. 12 is quite similar to FIG. 1, with the addition of a linear array spatial light modulator 131 of FIG. 11. [Hargis, col. 10, lin. 29-32]

"The number of modulated beamlets applied in parallel to the screen can range from two up to an extremely large number in excess of 200 depending upon the characteristics required of the system." [Hargis, col. 14, lin. 48-51]

Applicants are unable to determine from the Examiner's comments if the Examiner is contending that Figs. 16-29 of Hargis disclose different patterns of scan lines, or different patterns of spots. If the Examiner persists in the contentions advanced in the preliminary remarks of the Feb 13 OA, Applicants respectfully request that the Examiner clarify this ambiguity.

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

*To answer the Examiner directly*, the different scanning formats (methods, patterns) graphically illustrated in Figs. 16-29 of Hargis are written using the same scan lines with similar arrays of modulated beamlets. These graphical representations used by Hargis are for convenience in describing the different sequences. Applicants respectfully submit that the Examiner has apparently misinterpreted the graphic representations in Figs. 16-29 of Hargis as something other than convenient graphic representations of these sequences. If the Examiner persists in this interpretation of Figs. 16-29 in a future Official Action, Applicants respectfully request that the Examiner identify the specific language in the written description of Hargis supporting those contentions.

#### **EXAMINER'S DISCUSSION OF APPLICANTS' DISCLOSURE AND ARGUMENTS**

##### *Examiner's Comments Regarding Para 23 of Applicant's Specification*

The Examiner goes on to state on page 2 of the Feb 13 OA:

"It is also noted that the applicant's own specification discloses (para 23), that it has been known to scan diagonally and spiral form from the center of the frame or in from the outer edge."

This is a reference to the orientation and form of the scan lines with respect to the frame edges or boundaries, not to aligned spots angled with respect to scan lines (sweep paths). The orientation and form of the scan lines with respect to frame edges or boundaries is a completely different concept than Applicants' claimed aligned spots angled with respect to the scan lines being written during a given sweep path.

Further, the Examiner's reliance on Hargis is misplaced, because as noted above, such orientations of the sweep paths or scan lines to screen boundaries are not described by Figs. 16-29 and the corresponding written disclosure of Hargis. Even if Hargis did describe such orientations of the scan lines to the screen boundaries, this is again a completely different concept than that disclosed by the Applicants.

##### *The Examiner's Characterization of Applicants' Arguments*

On Page 2 of OA Feb 13, 2006, the Examiner indicates that "Applicant states that Hargis does not disclose any other orientation or pattern of the spots other than the vertical column shown in the figures." Applicants note that Hargis also discloses a square array in Fig. 31 that is not a vertical column; however, Applicants' remarks were directed to Figs. 16-29 of Hargis on which the Examiner's rejections were based. In summary, Applicants contend that Hargis does not disclose or suggest any orientation of the array of beamlets or modulators other than the vertical array appearing in Figs. 1, 11, 12, 12A and 17 as described above, or the square array appearing in Fig. 31.

#### **BASIS FOR REJECTIONS UNDER 35 USC 103(A)**

The Examiner bases the final rejection of Applicants' claims on the combination Conemac in view of Hargis. This rejection is based on a misinterpretation of the Hargis reference and of the plain recitations of Applicants' claims.

##### **Conemac**

On page 4 of the Feb 13 OA, the Examiner states:

"b) the claimed a scanner...is met by scanner 32 (Fig 2) which deflects the plural light beams simultaneously in a horizontal direction and second scanning element 212 deflects the lines in a vertical direction upon completion of each horizontal scan (Fig 4). Facets of scanner 32 are tilted

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

at different angles to provide plural swaths in different areas of the display screen (col 3, line 14-32)." (emphasis in original)

Hargis

On page 4 of the Feb 13 OA, the Examiner further states:

"Conemac also does not explicitly recite the conventional feature of slant/diagonal scanning the projection, where Conemac discloses horizontal line by line scanning.

The option/choice of a system in scanning in a slant, rectangular, triangle are conventional features available in the projection art and thus the examiner relies upon Hargis which discloses the various output options (Fig 16-29)."

As described in detail above, Hargis does not describe slant/diagonal scanning, but discloses different sequences of scanning lines which are depicted as sawtooth, triangular and other scanning formats illustrated in the cited Figs. 16-29 of Hargis. The cited figures of Hargis merely graphically describe the timing of the writing of each scan line, not the orientation of scan lines on the screen, and certainly not the orientation of spots on the screen as the spots are swept to illuminate scan lines.

*Combination of Conemac and Hargis Does Not Meet Applicants' Claims*

In reaching the conclusion that Applicants' claimed systems and methods are met by the cited portions of the disclosures of Conemac and Hargis, the Examiner has ignored the limitations of Applicants' claims, including without limitation independent claims 72, 90, 154, 165, 178, 179, 203, 207, 208 and 225, which respectively include the following recitations (emphasis added below for convenient reference):

Claim 72:

"...at least three of the spots are substantially aligned in a straight line angled with respect to the lines of dot locations.

Claim 90:

"...at least three spots of the pattern of spots are substantially aligned in a straight line angled with respect to the lines of dot locations."

Claim 154:

"...said light beams and said scanner are configured such that all of said spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such spots is swept along a different sweep path during at least one scan pass of such succession of scan passes.

Claim 165:

"...illuminating the viewing surface with two or more spots, all of such spots being substantially aligned along a slant line;  
sweeping the spots to substantially illuminate different sweep paths on the viewing surface, the slant line being substantially non-perpendicular to the sweep paths;

Claim 178:

"...said light beams and said scanner are configured such that two or more of said spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such aligned spots is swept along a different sweep path during at least one scan pass of such succession of scan passes."

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

## Claim 179:

“...said light beams and said scanner are configured such that *a majority of said spots are substantially aligned along a slant line substantially non-perpendicular to the sweep paths and each of such aligned spots is swept along a different sweep path* during at least one scan pass of such succession of scan passes.”

## Claim 203:

“...said light beams and said scanner are configured such that *said spots are substantially aligned along two or more slant lines, each slant line being substantially non-perpendicular to the sweep paths.*”

## Claim 207:

“...illuminating the viewing surface with three spots, *at least two of such spots substantially aligned along a slant line;*  
sweeping each of the aligned spots to substantially illuminate a different sweep path on the viewing surface, *the slant line being substantially non-perpendicular to the sweep paths;*”

## Claim 208:

“...illuminating the viewing surface with four or more spots, *a preponderance of such spots substantially aligned along a slant line;*  
sweeping each of the aligned spots to substantially illuminate a different sweep path on the viewing surface, *the slant line being substantially non-perpendicular to the sweep paths;*”

## Claim 225:

“...illuminating the viewing surface with four or more spots *substantially aligned along two or more slant lines;*  
sweeping each of the *aligned spots* to substantially illuminate at least three different sweep paths on the viewing surface, *each slant line being substantially non-perpendicular to the sweep paths;*”

As pointed out by Applicants in the preliminary remarks above, Hargis does not disclose or suggest slanted aligned spots illuminating different sweep paths. As stated by the Examiner, neither does Conemac. Hall is of no aid to the Examiner's position, and Applicants submit that no other cited reference or combination of cited references discloses or suggests aligned spots slanted with respect to sweep paths as claimed by Applicants. The advantages of this configuration of the spots on the screen are detailed in Applicants' disclosure.

*Rejection Based on Fig. 7*

On page 5 of the Feb 13 OA, the Examiner states:

“in considering the claim 158, 160, 170, 171, 174-176, 194, 198, 200, 217-220, 222-224, see Fig 7 for fiber optic head/coupler.”

Applicants assume that the Examiner is referring to Fig 7 of Conemac, not of Hargis. Conemac does disclose a fiber delivery head, but not an arrangement of fiber emitting ends that would produce the slanted aligned spots on the screen as claimed by Applicants. Reconsideration of these claims in light of this comment is requested.

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

*Improper Inclusion of Claims 160 and 217 in Rejection Based on Fig. 7*

Applicants further note that the Examiner has erroneously included in the claims identified with respect to Fig 7 of Conemac claims 160 and 217, which respectively include the following recitations in addition to optical fibers and emitting ends in a head (emphasis added for convenient reference):

**Claim 160:**

*"at least two optical fibers having emitting ends arranged in a head, said beams being emitted from such emitting ends; and  
said adjustable structure being adapted to move said head to change the orientation of the beams with respect to the scanner to change the angle of the slant line with respect to the sweep paths."*

**Claim 217:**

*"emitting light beams from emitting ends of optical fibers mounted in a head,  
orienting the head with respect to the scanner such that during the illuminating step the light beams form the spots on the viewing surface; and  
moving the head to change the orientation of the beams to the scanner thereby changing the angle of the slant line with respect to the sweep paths."*

Applicants request that the Examiner reconsider the rejection of these dependent claims in light of the limitations identified above.

*Examiner's Taking of Official Notice*

The Examiner has reiterated the Official Notice taken of certain alleged "facts" by the following statement on page 4 of the Official Action:

*"The use of one or more (meeting the claimed 2 or more, 3 or 4 or more light beams) is a conventional feature in projection systems, based upon the need of the system/designer, where a system can comprise one light sources that is separated into the respective color components or multiple beams/sources could be used thereby negating the separation state for each color, thus the Examiner takes OFFICIAL NOTICE regarding such."*

**Official Notice of Stated Facts is Improper**

For the reasons set forth in Applicants' response to Applicants' prior Amendment dated December 22, 2005 which are incorporated herein by reference, Applicants respectfully submit that OFFICIAL NOTICE of the facts broadly alleged by the Examiner does not meet the requirements of M.P.E.P. 2144.03. If the alleged facts are true, the Examiner should be able to easily locate a reference disclosing the same. To do otherwise would be to deprive Applicants of the ability to argue against the application of the Noticed broad facts to the present case.

**Statement of Noticed Facts is Ambiguous**

Applicants submit that Examiner's statement of the facts of which Official Notice is purportedly taken is ambiguous. Applicants respectfully request that if the Examiner persists in taking Official Notice, that the statement of facts of which Notice is taken be redrafted to insure that such Noticed facts as susceptible of objective determination.

Appl. No. 10/086,272  
Amendment & Response After Final Rejection

MAG-01C

## No Stated Correlation Between the Noticed Facts and Claims

Applicants do not find a correlation of the facts of which Official Notice is being taken to the rejection of any of the claims by the Examiner. Such correlation should be expressly stated in order for Applicants to be able to respond to the facts of which Official Notice is taken.

## Summary

Applicants respectfully request that the taking of Official Notice be withdrawn, and a specific prior art reference be cited disclosing the structure forming the basis for any rejection, or that a more simply stated, objectively certain, statement of facts be substituted for the statement of facts in the Official Action mailed February 22, 2006.

## CONCLUSION

In view of the above remarks and arguments, it is believed that all claims remaining in this case are allowable over, and not anticipated by or obvious in view of any of the cited references or any combination thereof. Therefore, the application is in condition for allowance, and it is respectfully requested that a timely Notice of Allowability be issued in this case. Applicants earnestly solicit an opportunity to discuss this case with the Examiner in a telephone interview at a time convenient to the Examiner. The Examiner is requested to advise the undersigned by telephone at mobile number (609) 558-0721, or by facsimile at (609) 806-2951, or by email at mosmith@tyco.com, of a convenient time and date for a teleconference.

Respectfully submitted,



Montgomery W. Smith, Reg. 31,141  
Attorney for Applicants  
Tel: (609) 558-0721